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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Armando Annunziato

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EXAMINER

CHAMBERS, TANGELA T

ART UNIT

PAPER NUMBER

2617

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/560,425	Applicant(s) ANNUNZIATO ET AL.	
	Examiner TANGELA T. CHAMBERS	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 27-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 27-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is in response to the amendment filed March 16, 2009.
2. Claims 27, 34-35, 43-44 and 50-52 have been amended.
3. Claims 27-52 are pending.

Priority

4. Acknowledgment is made of applicant's claim for domestic priority which provides a priority date of June 17, 2003.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 27-29, 31-37, 39-46 and 49-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riley et al (Riley) (US Patent Publication No. 2003/0125046 A1) in view of Phelts et al (Phelts) (US Patent Publication No. 2002/0101912 A1).

As per claims 27, 35 and 44, Riley discloses:

- ***A method for determining at least one location coordinate of a mobile terminal with respect to a set of reference elements adapted to send radioelectric signals toward said mobile terminal***, (Riley, Page 1, Paragraphs [0005]-[0007]), Riley teaches a mobile terminal using reference elements to calculate its position.
- ***measuring said radioelectric signals to derive respective measurements***, (Riley, Pages 2-3, Paragraph [0028]).

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- ***said measurements being affected by measurement errors;*** (Riley, Page 7, Paragraph [0081]), Riley teaches measurements being affected by errors.
- ***subjecting such measurements to state-based statistical filtering;*** (Riley, Page 2, Paragraph [0015], “After collection of multiple measurements upon the base station from one or more mobile stations from several different known locations, these measurements are used as input to a conventional position and time offset computation procedure, such as least squares, or a Kalman filter, as is commonly understood in the art of navigation (e.g., GPS and AFLT).”).
- ***selecting at least part of said set reference elements as terrestrial reference elements;*** (Riley, Page 1, Paragraph [0005] and Page 2, Paragraph [0015], “If the position and timing offset of the mobile station is determined from global position satellites or from a number of quality signals from base stations having known positions and timing offsets, then it is possible for the position and timing offset of the mobile station to be quite precise, often to approximately meter and nanosecond level accuracy.”).
- ***providing in said statistical filtering at least one further state in addition to said at least one location coordinate, said at least one further state being representative of said measurement errors,*** (Riley, Page 4, Paragraph [0044] – Page 5, Paragraph [0051], Page 6, Paragraphs [0069]-[0071] and Page 8, Paragraph [0084], “[T]he mobile station position (value and error estimate), mobile station timing offset (value and error estimate), and pseudorange measurement (value and error estimate) are used to improve the base station position[.]”).
- ***determining from said state-based statistical filtering said at least one location coordinate of said terminal,*** (Riley, Pages 2-3, Paragraphs [0015] and [0028] and Page 7, Paragraph [0082], “[T]he conventional use of the computation procedure [is] for computing the position and time offset of a mobile station from the known positions and known time offsets of multiple base stations.”).

Riley discloses statistical filtering and measurement errors in location determination but does not specifically disclose:

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- ***wherein said errors are non-zero mean errors***, However, Phelts in an analogous art discloses the limitation. (Phelts, Page 2, Paragraphs [0011]-[0012], Pages 4-5, Paragraph [0050] and Page 11, Paragraphs [0112]-[0115], "The tracking error in the pseudorange measurement propagates to position, velocity, and other measurements, and is therefore highly detrimental to the accuracy of the system. Multipath tracking errors are difficult to remove for a number of reasons. Multipath errors are not zero mean, particularly for large amplitude MP signals, so that even infinite smoothing of the computed pseudorange cannot guarantee unbiased position errors.")

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Phelts into the teaching of Riley to have non-zero mean errors. The modification would be obvious because one of ordinary skill in the art would want the benefit of reducing the effects of multipath in radio communications systems. (Phelts, Page 1, Paragraph [0003]).

As per claim 28, 36 and 45, Riley further discloses:

- ***wherein said statistical filtering is Kalman filtering***, (Riley, Page 2, Paragraph [0015], Page 6, Paragraph [0070] and Pages 8, Paragraph [0085], "[I]t is possible to use a filter, such as a Kalman filter, in order to improve continuously the value of the base station position and timing offset.").

As per claim 29, 37 and 46, Riley further discloses:

- ***associating with said respective measurements at least one additional measurement indicative of at least one of the location and displacement of said mobile terminal***, (Riley, Page 1, Paragraph [0005] and Pages 2-3, Paragraph [0028], "The CDMA network is capable of locating the position of the AFLT mobile station 22 and the hybrid mobile station 23 using the well-known AFLT technique of the mobile station measuring the time of arrival of so-called pilot radio signals from the base stations.").

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As per claim 31 and 39, Riley further discloses:

- ***including in said set of reference elements at least one satellite-based reference element of a satellite-based positioning system***, (Riley, Abstract and Page 1, Paragraphs [0005]-[0006] and Page 2, Paragraph [0027] – Page 3, Paragraph [0030], “A more advanced technique is hybrid position location, where the mobile station employs a Global Positioning System (GPS) receiver and the position is computed based on both AFLT and GPS measurements.”).

As per claim 32, 40 and 49, Riley further discloses:

- ***wherein measuring said radioelectric signals comprises the step of determining at least one parameter selected from the group consisting of: power received at said mobile terminal from said set of reference elements, timing advance, round trip time, observed time differences, and observed time differences of arrival***, (Riley, Page 2, Paragraph [0026] and Page 4, Paragraph [0042]), Riley teaches measuring radio-electric signals to determine the observed time differences.

As per claim 33 and 41, Riley further discloses:

- ***selecting at least part of said set of reference elements as elements comprising, together with said mobile terminal, a terrestrial cellular communication system***, (Riley, Fig. 1 and Page 2, Paragraphs [0025]-[0026], “FIG. 1 shows a CDMA cellular telephone network using a GPS system for locating mobile telephone units and calibrating base stations.”).

As per claims 34, 43 and 50, they are rejected under the same reasons set forth in connection of the rejections of claims 27 and 31.

As per claim 42, Riley further discloses:

- ***wherein at least one of said measurement module and said processing module includes a first portion hosted by said mobile terminal and a second***

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portion hosted by a location center, wherein said first and second portions are arranged for data exchange over said terrestrial cellular communication system, (Riley, Page 3, Paragraph [0031], “A mobile positioning center (MPC) 36 is connected to mobile switching center (MSC) 34. The MPC 36 manages position location applications and interfaces location data to external data networks through an interworking function (IWF) 37 and a data network link 38.”).

As per claim 51, it is rejected under the same reasons set forth in connection of the rejections of claims 27 – 34.

Claims 30, 38 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riley et al (Riley) (US Patent Publication No. 2003/0125046 A1), in view of Phelts et al (Phelts) (US Patent Publication No. 2002/0101912 A1) and in further view of McBurney et al (McBurney) (US Patent No. 6,055,477 A).

As per claim 30, 38 and 47, Riley teaches measuring an antenna position including the altitude in order to determine position information but does not specifically disclose:

- ***measuring an altitude coordinate of said mobile terminal,*** However, McBurney in an analogous art discloses the limitation. (McBurney, Abstract and Column 7, Line 60 – Column 8, Line 24, “An altimeter, barometer or other altitude sensor can provide altitude or elevation information that is accurate to within 10-20 meters, depending upon the time elapsed since the last calibration, the quality of the last calibration and the local rate of change of barometric pressure.”).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of McBurney into the teaching of Riley and Phelts to measure an altitude coordinate of a mobile terminal. The modification would be obvious because one of ordinary skill in the art would want the benefit of achieving an integration of measurements to provide better accuracy of two-

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dimensional and/or three-dimensional location coordinates than with one instrument's location coordinate(s) alone. (McBurney, Column 7, Lines 52-59).

Claims 48 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riley et al (Riley) (US Patent Publication No. 2003/0125046 A1), in view of Phelts et al (Phelts) (US Patent Publication No. 2002/0101912 A1), and in further view of Hoshino et al (Hoshino) (US Patent No. 6,081,230 A).

As per claim 48, Riley teaches obtaining the location of a mobile terminal but does not specifically disclose:

- ***wherein the terminal is mounted on a vehicle, and said at least one additional measurement is indicative of at least one of the location and displacement of said vehicle***, However, Hoshino in an analogous art discloses the above limitation. (Hoshino, Fig. 11 and Column 27, Lines 35-45).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Hoshino into the teaching of Riley and Phelts to have the terminal mounted on a vehicle to indicate location and displacement of the vehicle. The modification would be obvious because one of ordinary skill in the art would want the benefit of achieving a navigation system which enhances positioning accuracy without employing any sensor of high precision. (Hoshino, Column 5, Lines 20-53).

As per claim 52, it is rejected under the same reasons set forth in connection of the rejections of claims 44 – 50.

Conclusion

6. The prior art not relied upon but considered pertinent to applicant's disclosure is made of record and listed on form PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TANGELA T. CHAMBERS whose telephone number is 571-270-3168. The examiner can normally be reached Monday through Thursday, 9:00am-6:30pm Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nick Corsaro, can be reached at telephone number 571-272-7876. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tangela T. Chambers/

Patent Examiner, Art Unit 2617

May 16, 2009

/NICK CORSARO/

Supervisory Patent Examiner, Art Unit 2617